

What is claimed is:

1. A semiconductor device comprising:

a sealing member formed of an insulating resin and having an upper surface and a lower surface as a surface and a back surface, respectively, and side faces connecting the upper and lower surfaces with each other;

a semiconductor chip positioned within the sealing member, the semiconductor chip including electrodes respectively on a first main surface and a second main surface thereof as a surface and a back surface, respectively;

a first electrode plate having an upper surface and a lower surface as a surface and a back surface, respectively, a part of the upper surface of the first electrode plate being exposed to the upper surface of the sealing member and the lower surface portions of end portions of the first electrode plate being exposed to the lower surface of the sealing member; and

a second electrode plate having an upper surface and a lower surface as a surface and a back surface, respectively, the lower surface of the second electrode plate being exposed to the lower surface of the sealing member and the upper surface of the second electrode plate being positioned within the sealing member,

wherein the electrode on the second main surface of the semiconductor chip is electrically connected to the first or the second electrode plate through an electrically conductive adhesive, and

wherein a bump electrode is formed on a surface of the electrode formed on the first main surface of the semiconductor chip, the bump electrode is covered with an electrically conductive adhesive, and the bump electrode and the second or the first electrode plate are electrically connected to each other through the adhesive.

2. A semiconductor device according to claim 1, wherein the bump electrode and the second or the first electrode plate are not in contact with each other.

3. A semiconductor device according to claim 1, wherein the bump electrode is provided one or plurally on the electrode surface.

4. A semiconductor device according to claim 1, wherein the bump electrode is a stud type bump electrode formed on the electrode provided on the first main surface of the semiconductor chip.

5. A semiconductor device according to claim 1, wherein the bump electrode is a stud type bump electrode formed on the electrode provided on the first main surface of the semiconductor chip, and the bump electrode is provided

plurally on the electrode surface, of which the bump electrode(s) having a large height is (are) in contact with the first or the second electrode plate and the other bump electrode(s) is (are) not in contact with the first or the second electrode plate.

6. A semiconductor device according to claim 1, wherein a recess is formed in the surface of the first or the second electrode plate in an opposed relation to the bump electrode.

7. A semiconductor device according to claim 1, wherein ends of the electrode plates project to the outside from the side faces of the sealing member.

8. A semiconductor device according to claim 1, wherein ends of the electrode plates are each branched to plural branch ends which project to the outside from the side faces of the sealing member.

9. A semiconductor device according to claim 1, wherein the first electrode plate and the second electrode plate extend in different directions.

10. A semiconductor device according to claim 1, wherein the electrode provided on the semiconductor chip on which the bump electrode is formed is formed by an aluminum film.

11. A semiconductor device according to claim 1, wherein the bump electrode is formed by gold wire or copper wire,

and the adhesive is comprised of silver paste having been cured.

12. A semiconductor device according to claim 1, wherein the spacing between the first main surface of the semiconductor chip and the electrode plates which confront the first main surface of the chip is about 10 to 30 μm .

13. A semiconductor device according to claim 1, wherein a transistor is formed on the semiconductor chip, and a second electrode of the transistor is formed on the second main surface of the semiconductor chip,

wherein a first electrode and a control electrode of the transistor are formed on the first main surface of the semiconductor chip,

wherein the first or the second electrode plate is provided plurally, the second electrode is connected to the second or the first electrode plate, and

wherein the first electrode and the control electrode are connected separately to the plural first or second electrode plates.

14. A semiconductor device according to claim 1, wherein the adhesive which covers the bump electrode is spread over both the electrode region in which the bump electrode is formed and a region deviated from the electrode region and reaching positions near ends of the semiconductor chip.

15. A semiconductor device according to claim 1,
wherein the sealing member is in a quadrangular shape
having four of said side faces,
wherein ends of the first electrode plate project
from a pair of opposed side faces of the sealing member,
and

wherein ends of the second electrode plate project
from the other pair of side faces intersecting said pair of
opposed side faces of the sealing member.

16. A method of manufacturing a semiconductor device,
comprising the steps of:

providing a first lead frame including a patterned,
partially bent, first electrode plate and a second lead
frame including a patterned, flat plate-like second
electrode plate;

providing a semiconductor chip, the semiconductor chip
including an electrode on a first main surface thereof and
an electrode on a second main surface thereof opposite to
the first main surface;

connecting the electrode formed on the second main
surface of the semiconductor chip to the first electrode
plate of the first lead frame or to the second electrode
plate of the second lead frame electrically through an
electrically conductive adhesive;

connecting an electrically conductive wire on the electrode formed on the first main surface of the semiconductor chip by a thermocompression bonding method and pulling and thereby breaking the wire to form one or plural bump electrodes;

applying an electrically conductive adhesive over the electrodes so as to cover the bump electrode(s);

superimposing the second lead frame or the first lead frame on the adhesive applied over the bump electrode(s) and allowing the adhesive over the bump electrode(s) to cure to connect the electrode plate of the lead frame and the bump electrode(s) with each other electrically;

covering the portion including the first and second lead frames, the semiconductor chip and the adhesive with an insulating resin in such a manner that outer surfaces of the electrode plates of the first and second lead frames are exposed, to form a sealing member; and

cutting off unnecessary portions of the first and second lead frames in the vicinity of the sealing member,

wherein, in the step of providing the lead frames, the first lead frame is formed in such a manner that lower surface portions of end portions of the first electrode plate in the first lead frame are exposed to a lower surface of the sealing member and an upper surface of a

central portion of the first electrode plate is exposed to an upper surface of the sealing member.

17. A method according to claim 16, wherein the thickness of the adhesive which covers the bump electrode(s) is set larger than the height of the bump electrode(s) so as to prevent direct contact of the bump electrode(s) with the electrode plates.

18. A method according to claim 16, wherein a surface of the electrode plate which confronts the bump electrode(s) is depressed so as to prevent direct contact of the bump electrode(s) with the electrode plates.

19. A method according to claim 16, wherein, of the bump electrode(s), one having a large height is in contact with the electrode plate.

20. A method according to claim 16, wherein ends of the electrode plate in each of the lead frames are each patterned into branched ends, and the sealing member is formed so as to let the branched ends project to the outside from side faces of the sealing member.

21. A method according to claim 16, wherein the first and second lead frames are patterned so that an extending direction of end portions of the electrode plate connected to the first main surface of the semiconductor chip and an extending direction of end portions of the electrode plate

connected to the second main surface of the semiconductor chip are different from each other.

22. A method according to claim 16,

wherein the electrode provided on the semiconductor chip on which the bump electrode(s) is (are) formed is formed by an aluminum film,

wherein the bump electrode(s) is (are) formed by connecting gold wire or copper wire on the electrode by a thermocompression bonding method and then cutting off the gold or copper wire, and

wherein silver paste is used as the adhesive and is applied over the electrode so as to cover the bump electrode(s), thereafter the electrode plate of the second or the first lead frame is superimposed on the adhesive and the adhesive is cured to connect the electrode plate and the bump electrode(s) with each other electrically.

23. A method according to claim 16, wherein the thickness of the adhesive to be filled into the spacing between the first main surface of the semiconductor chip on which the bump electrode(s) is (are) formed and the electrode plates which confronts the first main surface of the chip is determined so that the spacing is about 10 to 30 μm .

24. A method according to claim 16,

wherein the semiconductor chip is formed with a

transistor including a first electrode and a control electrode on the first main surface and a second electrode on the second main surface,

wherein the electrode plate of one of the first and second lead frames is provided in a plural number, and

wherein the first electrode and the control electrode are electrically connected separately to the plural electrode plates.